



New Product

Si7413DN
Vishay Siliconix

P-Channel 20-V (D-S) MOSFET

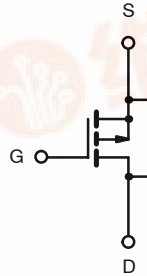
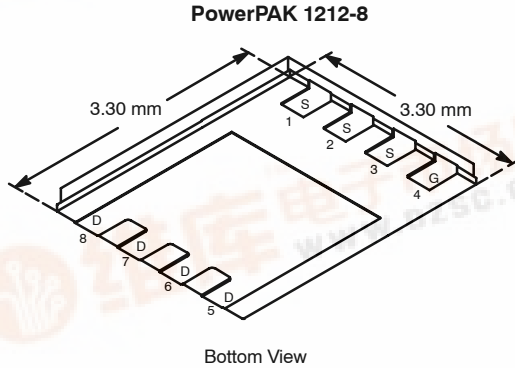
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
-20	0.015 @ V _{GS} = -4.5 V	-13.2
	0.020 @ V _{GS} = -2.5 V	-11.4
	0.029 @ V _{GS} = -1.8 V	-9.5

FEATURES

- TrenchFET® Power MOSFET
- New PowerPAK® Package
 - Low Thermal Resistance, R_{thJC}
 - Low 1.07-mm Profile

APPLICATIONS

- Load Switch



Ordering Information: Si7413DN-T1—E3

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V _{DS}	-20		V	
Gate-Source Voltage	V _{GS}	±8			
Continuous Drain Current (T _J = 150°C) ^a	I _D	T _A = 25°C	-13.2	-8.4	A
		T _A = 85°C	-9.5	-6.1	
Pulsed Drain Current	I _{DM}	-30			
Continuous Source Current (Diode Conduction) ^a	I _S	-3.2	-1.3		
Maximum Power Dissipation ^a	P _D	T _A = 25°C	3.8	1.5	W
		T _A = 85°C	2.0	0.8	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 sec	26	33	°C/W
		Steady State	65	81	
Maximum Junction-to-Case	R _{thJC}	1.9	2.4		

Notes:
a. Surface Mounted on 1" x 1" FR4 Board.

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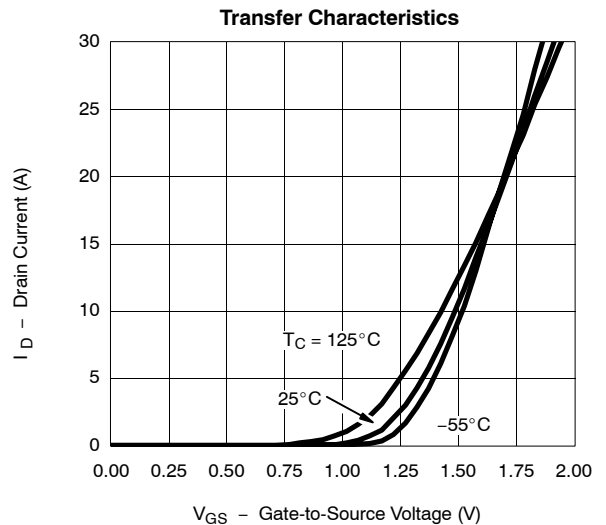
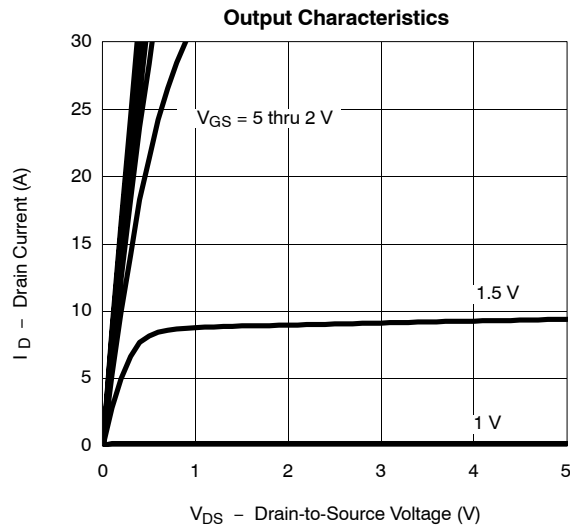


SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -400 μA	-0.4		-1.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -20 V, V _{GS} = 0 V, T _J = 85 °C			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -4.5 V	-30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -13.2 A		0.012	0.015	Ω
		V _{GS} = -2.5 V, I _D = -11.4 A		0.016	0.020	
		V _{GS} = -1.8 V, I _D = -3.5 A		0.023	0.029	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -13.2 A		47		S
Diode Forward Voltage ^a	V _{SD}	I _S = -3.2 A, V _{GS} = 0 V		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -13.2 A		34	51	nC
Gate-Source Charge	Q _{gs}			5.4		
Gate-Drain Charge	Q _{gd}			8.8		
Gate Resistance	R _g	f = 1 MHz		5		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, R _L = 10 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _g = 6 Ω		30	45	ns
Rise Time	t _r			50	75	
Turn-Off Delay Time	t _{d(off)}			200	300	
Fall Time	t _f			95	140	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = -3.2 A, di/dt = 100 A/μs		35	55	

Notes

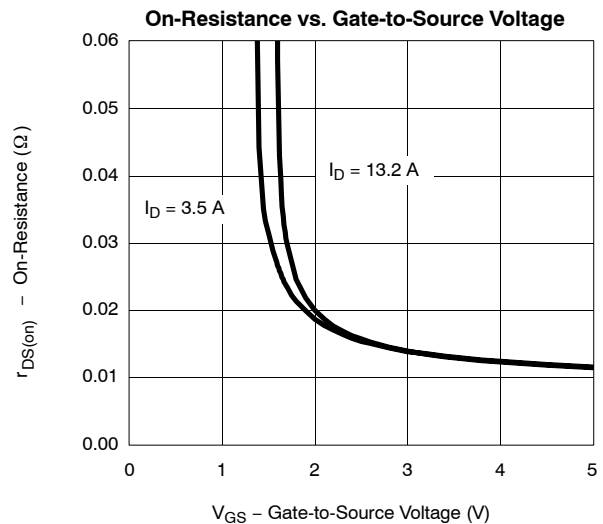
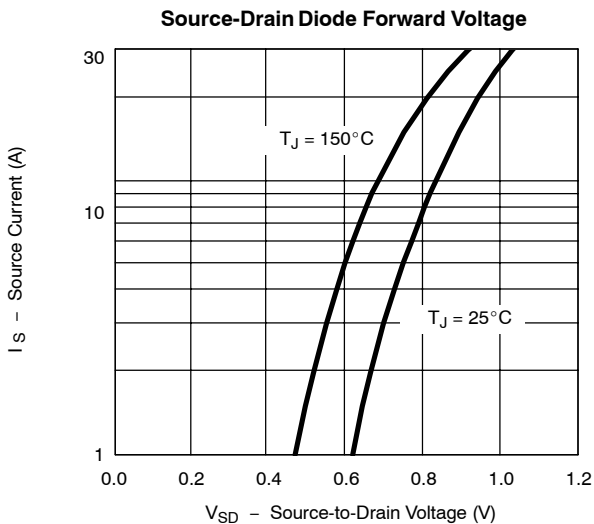
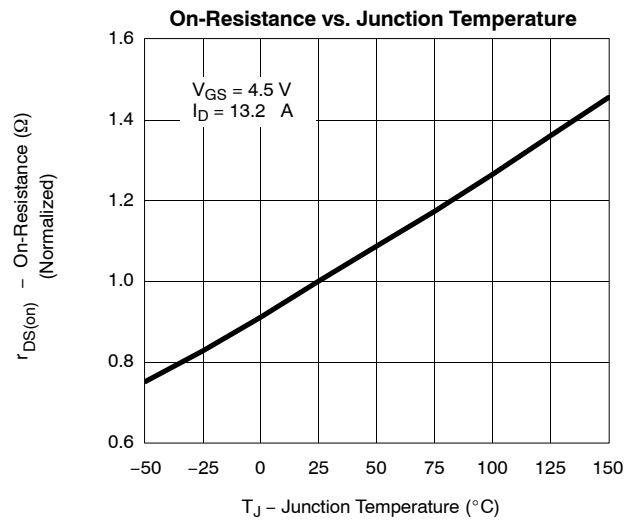
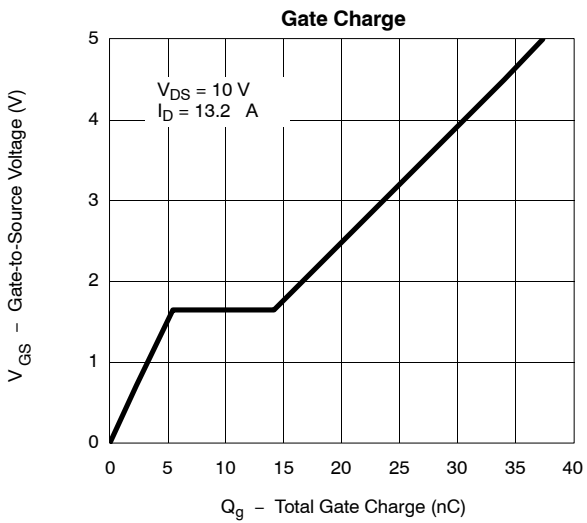
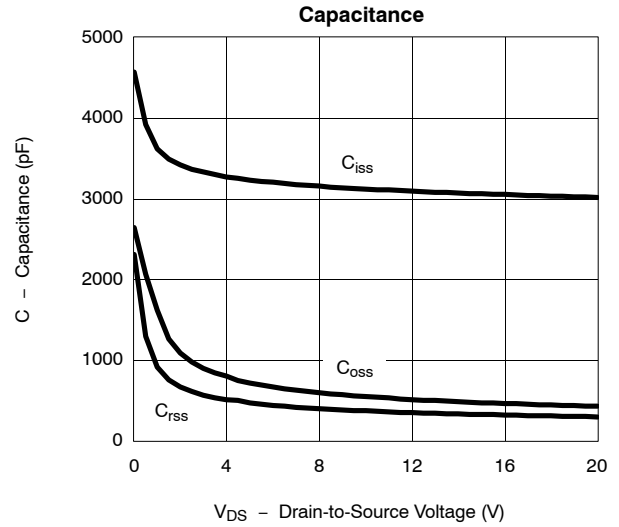
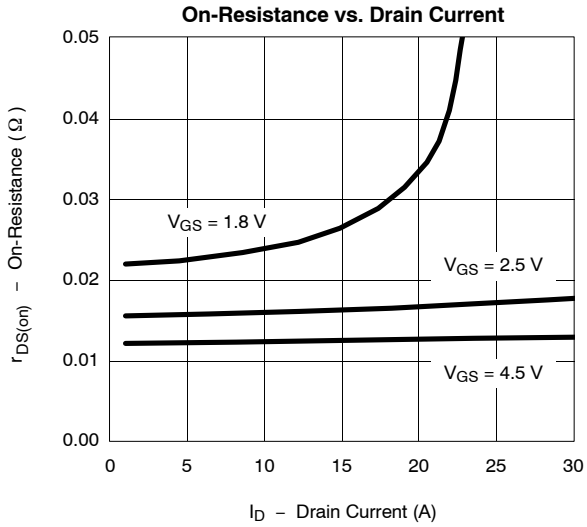
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



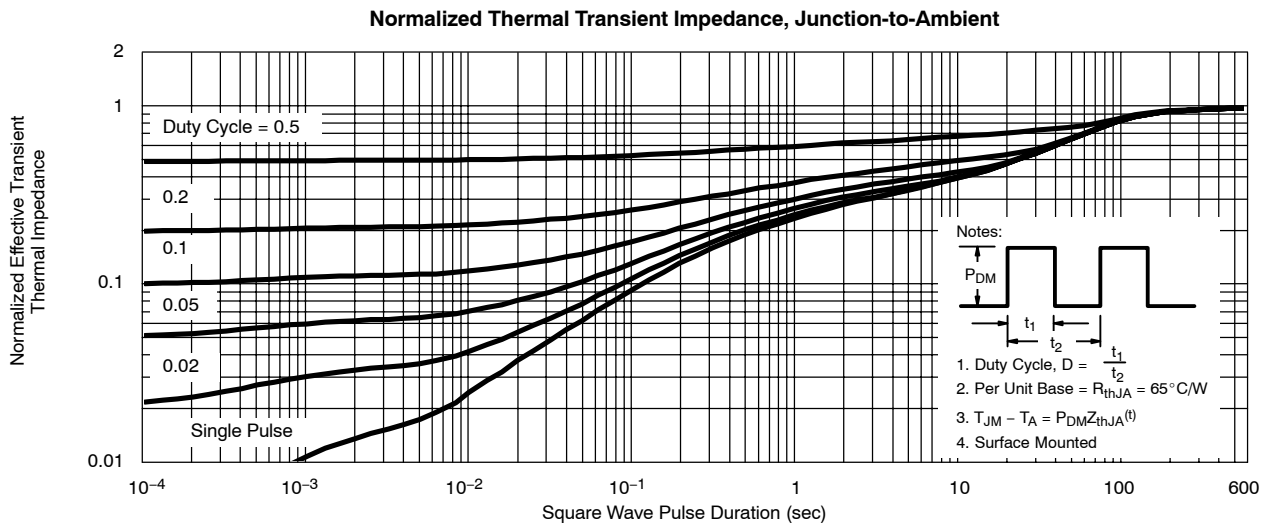
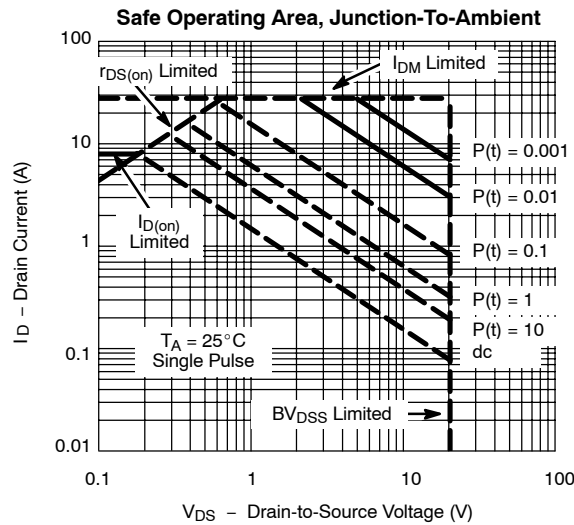
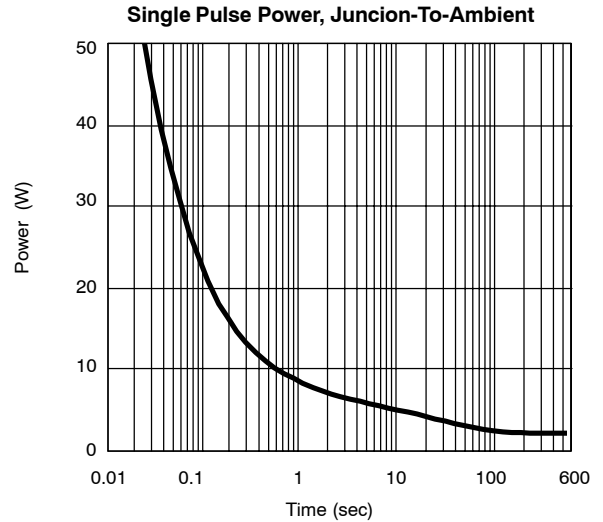
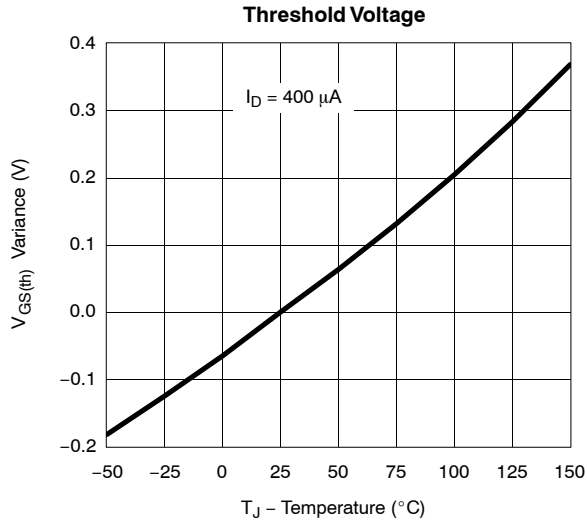


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